

LINNÆUS' "GENERA MORBORUM," AND SOME OF HIS OTHER MEDICAL WORKS.

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THE year 1907, the two hundredth anniversary of the birth of Carolus Linnæus, has served again to call attention to this great genius, and has produced numerous articles devoted to the splendid services rendered by this man of science. He most frequently is thought of as a botanist; his work in zoölogy is fairly well known; but his contributions to medicine, and his intimate association with members of the medical profession, in his younger years as well as after he had attained to prominence, seem to have escaped attention. When his father had determined to apprentice him to a tradesman, Rothman, a physician of Wexiö, took the boy into his own home and furnished him with books on botany and physiology. Dr. Celsius, of Upsala, engaged him as an assistant in botany and helped him to obtain private pupils; and Dr. Moræus, of Fahlun, influenced him to study medicine. These are all important events in the early life of Linnæus, and it is to the credit of the medical profession that it contained men who furnished him with aid and guidance at important periods in his early life.

The object of this article is to call attention to his more important medical works, and in particular to his very interesting study on the classification of diseases. Linnæus already had done notable work in botany when he decided to go to Holland to study medicine at the instigation of Dr. Moræus, whose daughter he later married. He chose as his school the Medical College of Harderwyck. Why he chose this school in preference to the noted college at Leyden it does not appear.

It does not seem that he was especially enthusiastic as a student of medicine. Botany took the greater part of his attention; physic was the study of his leisure hours. However, when it came to graduation he chose for his thesis a new hypothesis of the causes of the intermitting fevers of cold climates, especially those of his own country. In this dissertation he assigns as one of the principal causes, the water impregnated with argillous substances—an hypothesis, as one of his biographers states, "he took pains to render valid by many arguments and ingenious asservations." These, Bæck says, "make one willing to credit

the author, though the principal point might still be subject to doubt." He later on modified his views. After his examination and public defence of his thesis, Linnæus obtained on June 24, in the twenty-eighth year of his age, the degree he sought for. Van Gorter expressed himself as follows on his diploma: "The undersigned does certify that he has remarked in the learned Swede, now doctor of physic, Charles Linnæus, uncommon knowledge and erudition, not only in the different branches of physic but also in botany."

Before returning to Sweden he desired to see some of Holland's noted men. He accordingly went to Leyden where he met Van Swieten, one of the great pupils of Bœrhaave; Lieberkuhn from Berlin, then a student at Leyden and celebrated later for his microscopic work; Isaac Lawson, a Scotchman; and Dr. John Gronov.

The most eminent man then at Leyden was Herman Bœrhaave, the great physician, whom Linnæus for a long time sought in vain to see. Owing to Bœrhaave's immense practice, and his strict regularity, ambassadors, princes, and even Peter the Great himself, were obliged to wait their turn to obtain an interview. In addition it was quite necessary to give the servants a *douceur* in order to gain entrance. He finally obtained admittance by sending the great physician a copy of his "Systema Naturæ" then just published. Linnæus was called to meet Bœrhaave at his villa, where he was warmly welcomed by the aged physician. He made such a good impression that he was urged to stay in Holland and received a letter of introduction to Burman, then professor of botany in Amsterdam, with whom he remained until the spring of 1736 when another opportunity presented itself.

George Clifftort, burgomaster of Amsterdam and one of the directors of the Dutch East India Company, was a most zealous lover of the natural sciences and possessed a magnificent botanical garden at Hartecamp. Bœrhaave was his physician and on an occasion gave him the following advice: "You have plenty of everything, yet there is one thing alone you have not got to render your life completely happy. You are accustomed to live high, hence you are so frequently troubled with hypochondriac complaints. You must keep a physician of your own to prescribe and order your diet, and to take daily care of your health—in cases of a more serious nature he may consult me." "Well proposed," replied Clifftort, "but where shall I find such a clever and skilful

man?" "Never mind, this I shall make my own business. I know a young Swede, who is now at Amsterdam, it is him I shall recommend as the best to answer your purposes. Besides he is also an excellent botanist and will arrange your garden at Hartecamp." Linnæus could not wish for anything better, and gladly accepted. Hesitating whether he should dedicate his services to Æsculapius or to Flora, he resolved to consecrate them wholly to the latter.

In the summer of 1736 he visited England and there met Sir Hans Sloane, the founder of the British Museum, and a pupil of Sydenham. He was a very prominent physician of his time and in addition was highly respected for his philanthropy and patriotism. He did not receive Linnæus as warmly as might have been expected, but he readily permitted him to see his cabinet and his herbal of near two hundred and fifty divisions. Besides Sloane, Linnæus saw, while in England, Dillenius, professor of Botany at Oxford, Miller, and several others.

Of prominent French scientists and physicians of the times he gained the friendship of several, among them Bernard, and Anthony de Jussieu, and De Sauvages, of Montpellier, the author of a classification of diseases.

Boerhaave, who thus far had been the author of his good-fortune in Holland, recommended him for the position of physician in ordinary in the Dutch colony at Surinam, but this was not accepted. Boerhaave's regard for Linnæus was most high, and when admitted to the sick chamber of the great physician to take his final leave, the venerable man uttered these significant words: "I have lived my time out, and my days are at an end. I have done everything that was in my power. May God protect thee with whom this duty remains. What the world has required of me it has got, but from thee it expects much more. Farewell, my dear Linnæus."

In 1738-39, on his return to Stockholm, he began to practice. At first patients were few in number, but later he seemed to have had plenty to do as is indicated in a letter to Haller: "Æsculapius affords all that is good, but Flora yields but Siegesbecks." Siegesbecks, a pupil of Heister, had published some very cutting criticisms on his classification of plants. Heister, a man distinguished for his knowledge of anatomy and surgery, but as Stoeber says, "unskilful in his knowledge of botany," was a violent and implacable adversary of Linnæus. But instead of entering the field openly he made his attacks through his pupils.

Linnæus' medical work in Stockholm began to attract attention. He was appointed physician to the fleet and later botanist to the king. In addition he was allowed to perform a number of autopsies. In 1741 came his appointment to the professorship of physic and anatomy at Upsala, in the thirty-fourth year of his age. A year later he exchanged chairs with Rosen, the professor of botany; an advantage to both.

Although his position was now that of professor of botany, he did not lose his interest in his old vocation. From time to time he contributed articles which were of distinct value to the medical profession, and considering the status of medical knowledge at the time, place him with the advanced thinkers in medicine. At this time medicine was in a most confused state. It was the age of systems and theories, the result to a certain degree of the active work going on in the as yet immature sciences. Enough stimulation had come from the newer methods of scientific study to render the leaders in medical thought dissatisfied with the then existing method of classification of diseases or rather lack of classification. Sydenham, some years before the time of Linnæus, had pointed out the advantages of a systematic nosology in these words: "It would be a very good thing if all the diseases were reduced to definite and certain species with as much accuracy as the botanists have done with descriptions of plants." In 1731, de Sauvages had published a paper classifying diseases according to their symptoms and causes. In this classification there were eleven classes, forty-four orders, and three hundred and fourteen species.

Having met with great success in his classification of plants, Linnæus turned his attention to the classification of diseases. His period of practice and experience gained at the autopsies no doubt furnished him with valuable data as a basis for his work. The result of this study was his "Genera Morborum," published in 1759, and in some respects his most important medical publication. In it he divides diseases into classes, orders, and species, in much the same way as in his classification of plants. There are eleven classes, thirty-seven orders, and three hundred and twenty-five species. Symptoms are largely the basis of the work; the groups *Deformes* and *Vitia* represent anatomic forms. De Sauvages, in a later edition of his work, is said to have incorporated in his classification some of the features of Linnæus' method.

Linnaeus' Classification of Diseases.

MORBI.					
Febriles (e sanguine in medullam).....	}	EXANTHEMATICI.	I.		
		CRITICI.	II.		
		PHLOGISTICI.	III.		
Morbi (Temperati).....	{	Nervii	Sensationis DOLOROSI.	IV.	
			Judicii MENTALES.	V.	
			Motus..... QUIETALES.	VI.	
	Fluidi	{	Secretionis.	SUPPRESSORII.	VIII.
				EVACUATORII.	IX.
	Solidi	{	Interni	DEFORMES.	X.
				Externi VITIA.	XI.

- EXANTHEMATICI. Febris cum efflorescentia cutis maculata.
- CRITICI. Febris cum urinæ hypostasi lateritia.
- PHLOGISTICI. Febris cum pulsu duro, dolore topico.
- DOLOROSI. Doloris sensatio.
- MENTALES. Judicii alienatio.
- QUIETALES. Motus abolitio.
- MOTORII. Motus involuntarius.
- SUPPRESSORII. Meatum impeditio.
- EVACUATORII. Fluidorum evacuatio.
- DEFORMES. Solidorum facies mutata.
- VITIA. Externa palpabilia.

The first three classes are characterized by fever, but the three groups differ from each other in certain respects which give them their names.

I. The first class, *Exanthematici* (*Febris cum efflorescentia cutis maculata*), he divides into *contagiosi*, *sporadici*, and *solitarii*. The "*contagiosi*" contains six diseases; among these, variola, rubeola, and syphilis. The group "*sporadici*" contains three diseases: miliaria, uredo, and aphtha. The group "*solitarii*" is represented by one disease, namely erysipelas.

II. The second class is the *Critici* (*Febris cum urinæ hypostasi lateritia*). This contains three orders: (1) *continentes*, (2) *intermittentes*, and (3) *exacerbantes*. The names of these types are self-explanatory.

III. The third class, and likewise the third variety of fevers, is the *Phlogistici*, characterized by hard pulse and local pain. This class is divided into three orders: (1) *membranacii*, (2) *parenchymatici*, and (3) *musculosi*. There are seven diseases described under the "*membranacii*"; as examples may be mentioned pleuritis and cystitis. Under the "*parenchymatici*" are described seven diseases, all inflammations of organs except one, namely cyanche, described as "*inflammatio faucis*." Other dis-

eases put under this heading are hepatitis, splenitis, and nephritis. Only one disease is described under "*musculosi*," namely phlegmon.

IV. The fourth class is the *Dolorosi*, divided into two orders, the *intrinseci* and the *extrinseci*. This class includes pain in different parts of the body not associated with any other particular symptom; as, for example, under the "*intrinseci*" there are described ophthalmia, otalgia, and nephralgia. These are characterized simply as "*oculi dolor*," "*auris dolor*," and "*renis dolor*." Twenty species of disease are described under the "*intrinseci*."

Under the "*extrinseci*" are described five diseases, among which are arthritis and pruritus.

V. *Mentales*, the fifth class, is characterized as "*judicii alienatio*." There are three orders under this heading: *idealis*, *imaginarii*, and *pathetici*. Seven species of diseases are described under "*idealis*"; five, under "*imaginarii*"; and twelve, under "*pathetici*." Mental diseases like delirium, mania, and melancholia, are classed under "*idealis*"; panophobia and hypochondriasis, under "*imaginarii*"; bulimia, polydipsia, satyriasis and hydrophobia, under "*pathetici*."

VI. The sixth class is *Quietales*, defined as "*motus abolitio*." It includes three orders: *defectivi*, *soporosi*, and *privativi*. There are six species of disease under "*defectivi*," examples of which are lassitude, asthenia, and syncope. There are ten species under "*soporosi*," among which are somnolentia, apoplexy, paraplegia and stupor. The order "*privativi*" includes fifteen species, which represent, especially, defects in the various sensory apparatuses, but also a few other defects such as amentia ("*imaginationis defectus*"), amnesia ("*memoriæ defectus*"), aphonia ("*loquelæ privatio*"), and atony ("*fibrarum muscularium contractionis defectus*"). As examples of sensory defects are classed amblyopia, cataract, cophosis, and anosmia.

VII. The seventh class is the *Motorii*. Under this are included two orders: *spastici* and *agitorii*. Ten species are found under the "*spastici*"; among these, spasms, trismus, and tetanus. Fifteen species are found under "*agitorii*"; tremor, subsultus, chorea, and epilepsy may be mentioned.

VIII. *Suppressorii* (*Meatum impeditio*). This class is divided into two orders: *suffocatorii* and *constrictorii*. Under "*suffocatorii*" are included conditions which interfere directly or indirectly with respiration or the voice, or the abnormal functioning of parts involved in respiration and the use of the voice.

There are eighteen species under this order. The following may serve as examples: hoarseness ("raucedo"), sighing ("suspirium"), yawning ("oscitatio"), snoring ("stertor"), dyspnoea, and asthma.

The order "*constrictorii*" is a small group. It includes eight species. All except two represent involvement of the genito-urinary and gastro-intestinal tracts. These two are aglutition ("*deglutitio impedita*") and agalactia ("*lactis defectus*"). Among the others may be mentioned obstipation, dysmenorrhœa, and sterility.

IX. *Evacuatorii* (*Fluidorum evacuatio*). This class is divided into five orders: *capitis*, *thoracis*, *abdominis*, *genitalium*, and *corporis externi*. "*Capitis*" includes six species, among which are otorrhea, hemorrhagia, coryza, and ptyalism. "*Thoracis*" contains four species: hawking ("*screatus*"), expectoration, hemoptysis, and vomica. "*Abdominis*" contains fourteen species: ructus ("*resectio flatuum frequens*"), nausea, vomitus, diarrhea, dysentery, and tenesmus, may serve as types. The order "*genitalium*" contains eleven species, all representing genito-urinary disorders; as representative of this group may be mentioned diabetes, hematuria, gonorrhœa, menorrhagia, parturition, and abortion. The fifth order under "*Evacuatorii*" is "*corporis externi*"; there are only two species under this heading, namely, galactorrhea ("*lactis effluxus*") and sweating ("*sudor*").

X. *Deformes* (*Solidorum facies mutata*). This is divided into three orders: *emaciantes*, *tumidosi*, and *decolores*. The "*emaciantes*" includes five species: phthisis, tabes, atrophia, marasmus and rachitis. The order "*tumidosi*" includes eight species, all characterized by more or less swelling. Among these there are mentioned polysarcia, anasarca, hydrocephalus, ascites and tympanitis. "*Decolores*" includes five species: cachexia, chlorosis, scorbutus, icturus and plethora.

XI. *Vitia* (*Externa palpabilia*). This is the largest class in the "Genera Morborum," both in number of orders and species of disease. It is divided into eight orders: *humoralia*, *dialytica*, *exulcerationes*, *scabies*, *tumores*, *procidentiæ*, *deformationes*, and *maculæ*.

"*Humoralia*" contains nine species; as representatives may be mentioned emphysema, œdema, inflammation, abscess, and gangrene.

The second order, "*dialytica*" ("*solutiones continui*"), contains fourteen species, their predominating characteristics being

indicated as above described. Fractures, rupture, contusions, tingling, burning, and chapping are typical representatives.

The third order is "*exulcerationes*" (*suppurationes aperta*"), containing thirteen species. As examples may be mentioned ulcers, noma, carcinoma, ozena (which is described as "*ulcus intra antrum Highmori*"), caries, and paronychia.

The fourth order is "*scabies*." Under this heading were included formerly a great variety of skin lesions totally different from the disease now known by that name. Linnæus uses the term to designate an order, and the species has nineteen diseases. The more important of these are lepra, tinea, psora, herpes, anthrax, pustule, papule, verruca, clavus, and styæ.

The fifth order is "*tumores protuberantes*." This includes ten species, all characterized by swelling and tumor formation. The more important are aneurisms, varix, scirrhus ("*glandula endureta*"), struma, anchylosis ("*tumor geniculorum*"), ganglion, and exostosis.

The sixth order is "*procidentiæ*." Eight pathological conditions are spoken of. As examples may be mentioned hernia, prolapse, and ectropium.

The seventh order is "*deformationes*." This includes eighteen species of deformities. Among these we have contractions, distortions, strabismus, myopia, presbyopia, lagostoma ("*labium superius oris fissum*"), atresia ("*meatus corporis imperforatus*"), hirsuties, and alopecia. As may be seen, a number of conditions are included which now would hardly be classed as deformities.

The eighth, and last, order is "*maculæ*." Under this are put nine species of abnormalities of the skin; cicatrix, nævus, melasma, and lentigo are the more important.

These, then, in brief are the essential points of the "Genera Morborum." In view of the imperfect state of pathology, anatomy, and physiology, the ignorance in regard to the etiology of disease at that time, it is to be considered as a creditable contribution to medicine.

Some of his other medical works and his views on medicine may be mentioned. The most important of these works is his "Clavis Medicinæ Duplex Exterior et Interior." This was really a compendium of the whole science, and an epitomical sketch of the virtues and effects of medicines.

Linnæus also wrote and lectured on the subject of dietetics. "This science," he says in a letter to a friend, in 1744, "makes my delight. I have collected more than I know any others to

have done." He published a number of treatises on motion, diversity of ailments, edible plants of Sweden, and on numerous other similar subjects.

He recognized the causation of death by the lodgment in the lungs of fibrinous polypi carried in the circulation. He also gave a good description of aphasia, and distinguished between central hemorrhage and congestion.

As evidence of his advanced views on medical subjects may be mentioned that he believed that scabies, epidemic dysentery, pertussis, smallpox, pest, leprosy, pulmonary phthisis, and malarial fever were caused by the entrance of small, living animals into the body.

In 1748 he studied the *tænia* and reported some new observations, among which was the first description of *tænia solium*. *Felicitis maris* was recommended by him, but evidently this passed unnoticed inasmuch as later, in France, this remedy was sold as a secret to a royal family.

His treatise on *Materia Medica* placed this branch of medicine on a firm foundation, though it did not escape criticism. Vic d'Azyr, secretary of the medical society of Paris, said: "This work is little worthy of its author."

Linnæus' well-known views on the efficacy of strawberries in gout were published in 1750. He firmly believed that he was cured of this malady by the use of this fruit.

In addition to introducing system into the classification of drugs, he brought to the attention of the profession quassia, solanum, dulcamara, and the importance of various poisons if rightly used.

In this brief and imperfect review of the brilliant career of one of the world's greatest geniuses, it has been possible to point out only in a casual way the items of particular interest to the medical man. Linnæus is not to be remembered alone as a botanist. His medical works are too important. His name is entitled to a lasting place in the history of medicine. His classification of diseases, his rearrangement of *materia medica*, his introduction of new drugs, his solid contributions to medical science, his advanced views on the etiology of certain contagious diseases—all these entitle him to enduring fame and honor in the medical profession. Moreover, we may draw a lesson from the study of the life and methods of this great physician-scientist which may be put in his own words, taken from a letter to Haller in which he says, referring to his greatest two contemporaries, Haller and Dillenius, "You both have read the same book which I read—you have read Nature."